

THE PERSISTENCE TRIANGLE

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Albert Einstein once defined insanity as *doing the same thing over and over again, but expecting a different outcome*. His comment is a great place to begin thinking about what it means to be *Persistent*. According to Art Costa and Bena Kallick, persisting is one of the Habits of Mind associated with intelligent behavior. For many students, however, when teachers, parents or other adults encourage them to be persistent it feels as if they are being asked to be insane. After all, from the student's perspective, if the only strategy, theory, or tactic in her repertoire didn't work, it really doesn't make sense to just keep trying harder. For many, "just trying harder" can lead to repeated failure and frustration. So the question for those teaching Habits of Mind might be: "How can we help students, parents, administrators, and teachers develop a more useful understanding of what it really means to be Persistent?"

First, it is often helpful to provide students with a deeper understanding of what this Habit really is. When teaching Persistence, we can provide students with cognitive models that support this kind of thinking. This article will examine one model and suggest how it might be used to help teach the attributes of persistence. Next, ways that this model can be used as a foundation for internalizing an intelligent approach to almost any academic *challenge* will be described. And last, the article will suggest how teachers might use the model as a template for designing academic challenges that foster persistence.

Definition

So what is Persistence? Art Costa's experience teaching Habits of Mind has lead him to see patterns regarding Persistence:

First, we should remind students that Persistence is a set of teachable behaviors for approaching problems, challenges and for working to reach other academic or non-academic outcomes. The behaviors of persistence include the ability to:

- Define, refine, clarify and analyze the problem.
- Develop and use a system, structure or strategy of problem attack including knowledge of steps to be performed, what data needs to be generated or collected, and what resources are available.
- Identify appropriate resources, including knowing who and where to turn for assistance.
- Collect evidence that the strategy is or isn't working.

- Recognize when a theory/strategy must be rejected and another employed.
- Apply alternative strategies/theories when it is appropriate to do so.
- Keep working toward solving the problem.

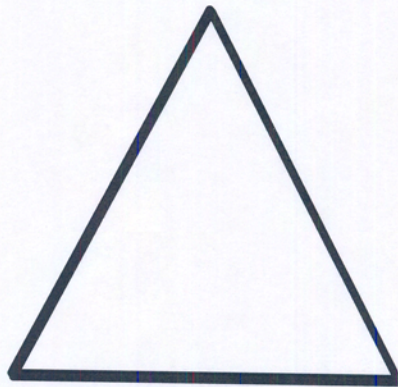
The Persistence Triangle

To help students internalize this approach, many teachers have had success using the Persistence Triangle. (See below) This model is a means to help learners define and analyze the problem and to generate possible solution strategies. In addition it provides a concrete structure for problem attack.

Each corner of the triangle represents a set of questions or concerns that the student should consider *before she begins working on the problem*. By focusing her thinking on these aspects of the problem, the student is able to be more conscious, more metacognitive, and more Persistent.

Parameters/ Resources related to the Problem:

- What information do I have?
- What information do I need?
- What materials are available?
- How much time do I have?
- Who can I work with?



Ways of Generating Possible Strategies:

- Brainstorm.
- Derive strategies from some other sources.
- Draw on Past Experience with Similar problems.

What does Success look like?

- How will I know I am finished?
- What is the criteria for success?

How will I know that it is time to switch strategies?

- What criteria will I use?
- What feelings might tell me?

Understanding Parameters

The top corner requires that the student consider the parameters of the problem. Parameters include the factors that restrict the problem, such as the resources of time, information, materials, and whether the student must work alone or with others. Other examples of parameters might include physical materials: equipment, pens, markers, paper, computers, etc. In addition, parameters can include or preclude access to resources or information or procedures as per teacher discretion. For instance, a teacher might provide students with specific theories, skills or procedures that must be included as part of the solution to a particular problem or challenge in order to reinforce the new learning. All problems, and all projects have parameters, and these parameters influence not only the final product, but also the means to the end. This corner asks students (and their teachers) to consider these factors.

Determining Success and Knowing When to Switch Strategies

Although clarifying what a question or problem is asking is an essential first step, most students actually fail to do so. Instead they often jump to the first solving strategy that occurs to them in order to get an answer quickly. To slow this process down, and to help students learn to manage their impulsivity, the next corner asks students to be conscious of two other aspects of the problem: "How will I know I have completed this successfully?" and "How will I know that it is time to switch strategies or theories?" This corner requires students to contemplate and understand the essential question that is being asked *before they start trying to solve it*. To do this, students must have some criteria for success. The criteria could come from the student herself, from her team or from a rubric the teacher provides. Regardless of the source of the criteria, in order to be persistent, students must have a clear idea of the outcome or goal that they are working to achieve. A clear goal enables students to monitor progress. A clearly defined goal provides the student with the opportunity to monitor and benefit from feedback about the strategies she is using to reach the goal. And with coaching and practice, students begin to define these aspects of the problem autonomously.

The second corner also serves to make students aware of when they should switch strategies or theories. There are many ways to determine when to switch. For instance, students might list ways that they know they are becoming frustrated. By making a concrete list of the physical sensations, or the observable frustration behaviors of members of her learning team, the student will come to see that frustration is actually a signal that says that it is time to try a different approach. Instead of being an excuse for quitting, frustration becomes a tool for knowing that the current strategy isn't working. To be persistent means to work smarter, not harder; this includes recognizing when to switch strategies or theories.

Often we teach students that there are specific times to switch strategies as part of problem-solving algorithms. Most students know that after they have subtracted one number from another that they should switch to an adding strategy to check the answer. In the classroom that is a home for the mind, the student learns two things: when to switch strategies, and criteria for knowing the problem is solved. The more we nurture

persistence, the more we enable students to take on this responsibility. It is not enough to just give the students the criteria for this corner, we want to make them aware that it is a Habit of Mind to consider these questions before jumping in to get an answer

Generally, we have found that often the best students travel back and forth between these first two corners before moving on to the third. Obviously, this is not always the case, nor should it be, but it may help some students manage their impulsivity, especially if they tend to start with the first strategy that occurs to them.

The third corner focuses the student's thinking on the possible strategies that would apply to this problem given the parameters and goals. Here, a teacher can limit his students to some specific strategies that he has taught, or he might allow students to brainstorm their own. It is important however that students understand that in order to practice persistence they should generate a number of possible strategies so that they will have choices. Half-way through a problem, the student may decide to switch strategies, and it is useful to have already identified possibilities even if the student ultimately chooses a strategy that was not on her original list of possibilities. Persistence is about being conscious of choices, criteria and outcomes.

There are a number of ways that students can generate a list of appropriate strategies. They can brainstorm or draw on their past experience with similar problem. Students can also be encouraged to derive strategies from other sources as well, such as books, classmates, the teacher, or electronic media or the Internet.

Application

Students will not automatically become Persistent, nor will they automatically apply the persistence triangle to the learning challenges we give them. When we teach this model to teachers we try to help them see the difference between declarative knowledge and actual application. So after we teach the model, we give them their first challenge:

Working as a team, using the information from your notes and the other smart people on your team, you will have five minutes to make sure that everyone on your team will get an "A" on a quiz that asks what the three corners of the Persistence Triangle are. Each person must be able to explain in his or her own words without using notes. You will know you are finished when you have evidence that each person can get an "A." You are free to use whatever teaching/learning strategies that will work for you.

After five minutes we debrief with the teachers by asking first, "Would everyone in your group get an "A," and how do you know they would? From here we analyze the challenge itself and ask the groups to identify information pertaining to each of the three corners. (We never actually give the quiz.) The teachers are readily able to identify and elaborate on the congruence between the triangle and the elements of the challenge.

Next we give them a second challenge, this time with something a little harder:

Working alone, using pencil and paper if you wish, you'll have up to five minutes to solve a problem that will be on the overhead. The problem will remain there for the entire time and you should use the Persistence Triangle to help you work through the problem. There is only one right answer. You will know you are finished when you can prove your answer using the available information. You will be interrupted from time to time, but we will keep track of the time for you. Go!

Then we give them this problem on the overhead:

Sally is shorter than Betty. Tara is taller than Mildred. Sally is shorter than Mildred. Jeff is taller than Tara. Jeff is shorter than Betty. Sue is taller than Betty. Is Betty taller than Sally?

After about 30 seconds, we stop the group, turn off the overhead and debrief what people are doing. We ask these questions:

How many people are using a strategy such as stick figures, lines, or names written at different heights or something similar to solve this problem? (Usually the majority of people will raise their hands.)

Next we point out that what most people do is start solving with the first strategy that occurs to them, and that this is normal, even natural. Sometimes we even talk about the notion that good Habits of Mind are not natural. We must learn to think deliberately to be really skilled at this.

Next, without turning the overhead back on, we ask how many people can tell us what the question is that they are trying to solve. Again, most people are not able to name the question that is being asked. As we debrief, we talk about the importance of giving students opportunities to learn from their experience. In fact, students must forget to apply the triangle many times on the way to learning to remember to use it. It is part of the learning process to forget a number of times on the way to learning to remember.

Finally before turning the overhead back on, we remind the teachers of the difference between declarative knowledge and application. Everyone would have gotten an "A," on the quiz. And so it will be with students.

So then we review the three corners. And then we turn on the overhead again, this time with the parameter that people can work in teams. Immediately people apply the triangle and realize that the answer to the question, "*Is Betty taller than Sally?*" is in the first sentence, "*Sally is shorter than Betty.*" After some laughter and a few moans, we have teachers regroup in grade alike or subject area groups to brainstorm additional applications for the classroom, and we use the triangle to frame their work.

For instance, the Persistence Triangle can be applied to just about any project that the students might encounter. It is perfect for authentic writing assignments. The parameters include information about the context: the purpose, topic, content, audience and reason for writing. The criteria for success can be teacher-generated rubrics, or an authentic goal for writing related to the author's purpose. And possible strategies could include anything from a letter to the editor or a television commercial to a short story, poem or persuasive essay. In science, the parameters refer to information the students already possess, as well as the means to generate additional data through experiments or other research. Success criteria could be the development of a coherent theory that successfully incorporates the data.

Further Considerations

Once students begin to integrate the model, they will be sensitive to the parameters, criteria and strategies that frame academic challenges. They will be more likely to approach problems more deliberately. And teachers too become more conscious of how they frame such challenges. It becomes more and more evident that that teacher must provide the means for students to address each of the corners in the Persistence Triangle.

As teachers first start designing challenges for students, they begin to be aware that they must consider the parameters, criteria for success and the possible strategies as well. How will students acquire necessary information? How much time, and what other resources should be available? How will students know what information they will need? In addition, how will the students know what success is? Will the teacher give the criteria, or will the students develop the criteria? If the students generate the rubrics for success, how will they gain information about what makes these rubrics sound? And will the students be limited to specific strategies for solving the problem or meeting the challenge? The teacher may also want to consider how the student might uncover strategies that would be appropriate. Over time, teachers become more skilled at teaching students to be more and more autonomous. And at the same time, these teachers become more conscious of their responsibility to help students develop the ability to practice this Persistence.